

## ABSTRACT

### EFFECT OF DEMINERALIZED FREEZE DRIED BOVINE BONE XENOGRAFT ON EXPRESSION OF RUNT-RELATED TRANSCRIPTION FACTOR-2 PROTEIN AND ALKALINE PHOSPHATASE PROTEIN IN HUMAN ADIPOSE DERIVED MESENCHYMAL STEM CELL CULTURE

**Background:** One source of non-immunogenic bone graft is Bovine Hydroxyapatite (BHA), but it is lacking in the potential for osteoinduction. Recent research has shown that demineralized freeze-dried bovine xenograft (DFDBX) has the potential for osteoinduction and contains transforming growth factor  $\beta$  (TGF  $\beta$ ) and Bone Morphogenic Protein (BMP) which trigger differentiation of Bone Marrow Mesenchymal (BM-MSC) into osteoblasts. This study was conducted to assess the potential for osteoinduction in vitro using human adipose derived mesenchymal stem cells (hAD-MSC) by comparing proteins that express RUNX-2 and ALP on BHA that have been used and commercialized compared to new materials developed by DFDBX. **Objective:** to determine the expression of RUNX-2 protein and ALP protein in hAD-MSC cultures after exposure to DFDBX and BHA. **Method:** hAD-MSC cultures were divided into 4 groups which were 2.5% DFDBX conditioned medium, 2.5% BHA conditioned medium, positive control (osteogenic medium), and negative control group (containing the basic medium of cell growth) and then planted in slide on the microplate. Observation of RUNX-2 and ALP expression was carried out after 2, 7 and 14 days of culture with the western blot methods. **Result:** The results of the study carried out using western blot examination and ImageJ software showed that there were differences in the number of RUNX-2 and ALP expressions on days 2, 7 and 14. **Conclusion:** Through this research it can be proven that there are expressions of RUNX-2 protein and ALP protein in Human adipose mesenchymal stem cell cultures after exposure to DFDBX and BHA with Western blot examination methods.

**Keywords:** Bovine Hydroxyapatite, Demineralized freeze-dried bovine bone xenograft, Runt-Related Transcription Factor-2, Alkaline Phosphatase, human adipose derived mesenchymal stem cell, Western blot